

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-5 and 7-15 are pending in the application, with claim 1 being the independent claim. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned “**Version with markings to show changes made.**”

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-5 and 7-15 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,165,802 to Cuchiario et al. (“Cuchiario”) in view of Japanese Patent Nos. JP403049229A to Yokoyama et al. (“Yokoyama”) and JP402105556A to Furuhashi et al. (“Furuhashi”). Specifically, the Examiner asserts that claim 1 is unpatentable because the present invention is obvious based on the product of Cuchiario as modified by Yokoyama and Furuhashi. The Examiner also asserts that claims 10-15 are unpatentable because the product-by-process

limitations produce a product that is obvious from the product of Cuchiario. Applicant respectfully disagrees and traverses this rejection.

As per claim 1, the Office Action fails to establish a *prima facie* case of obviousness because the combination of Cuchiario in view of Yokoyama and Furuhashi does not teach or suggest the claimed invention.

Claim 1, as amended, recites:

A wiring layer structure connected to a first electrode ***of a ferroelectric capacitor*** having first and second electrodes, comprising:

a main wiring layer including a first material; and

a coating layer including ***a first coating part*** provided between said main wiring layer and said first electrode, ***a second coating part*** provided on the top surface of said main wiring layer, and ***a third coating part*** provided on side faces of said main wiring layer;

wherein said first material reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer, and ***said coating layer is conductive and comprises a second material for preventing the infiltration of said substance into said main wiring layer.***

For example, reading claim 1 on the embodiment illustrated in figure 1, a wiring layer structure connected to a first electrode of a ferroelectric capacitor having first and second electrodes is provided. The wiring structure comprises a main wiring layer 30 and a coating layer on the outer periphery of this main wiring layer. The main wiring layer comprises a first material that reacts with a substance that infiltrates from the outside to this main wiring layer to produce a reducing agent.

The coating layer comprises a first coating part 20 provided between the main wiring layer and the first electrode; a second coating part 50 provided on the top surface of the main wiring layer and a third coating part 40 provided on the side faces of the main wiring layer. The coating layer is conductive and comprises a second material for preventing infiltration in the main wiring layer of the substance.

The three distinct coating parts of Applicant's amended claim 1 advantageously prevent any reaction between substances, i.e., water or molecular hydrogen, on the surface of the main wiring layer. Because no reducing agent is provided in the main wiring layer, Applicant's invention more effectively prevents a degradation of the characteristics of a ferroelectric capacitor that is caused by the reaction.

The Examiner asserts that Cuchiaro discloses a main wiring layer (134) and a coating layer (126) including a first coating part provided between said main wiring layer and said first electrode. The Examiner further asserts that Cuchiaro fails to disclose the following recitations:

- (a) a main wiring layer [that] comprises a first material that reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer
- (b) a second coating part provided on the top surface of said main wiring layer; and
- (c) a third coating provided on side faces of said main wiring layer.

With respect to recitation (a), on page 3 of the Office Action, the Examiner asserts that because this recitation is a product-by-process limitation, the recitation is obvious from the product of Cuchiaro. Applicant contends that the recitations identified by the Examiner as product-by-process limitations are *actually characteristics* of the first material comprising the

claimed wiring structure. Consequently, the Examiner has failed to establish a *prima facie* case of obviousness because none of the applied references disclose this recitation.

By way of example, in the claimed apparatus, the claim recitation "a first material that reacts with a substance to produce a reducing agent" recites *properties of the first material* comprising the main wiring layer. This claim recitation has *no relationship to how the main wiring layer is formed*. Instead, this recitation describes a *characteristic* of the first material.

In Applicant's previous communication dated October 29, 2002, Applicant amended claim 1 to recite, "a main wiring layer including a first material that reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer." The present rejection does not appear to address this amendment. Instead, the present rejection appears to only address claim 1 as originally filed. Nonetheless, to further clarify that this recitation is *a characteristic of the substance comprising the claimed wiring structure*, Applicant has amended claim 1 to recite "wherein said first material reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer." This amendment more clearly demonstrates that the recitation "that reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer" is a *characteristic* of the first material and not a product-by-process limitation. The main wiring layer is not formed by the reaction of the first material. Because this recitation is not a product-by process limitation and neither Cuchiario nor any of the cited references disclose "a main wiring layer including a first material...wherein said first material

reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer," the Examiner has failed to establish *a prima facie* case of obviousness.

With respect to recitation (b), in the Office Action on pages 3-4, the Examiner asserts that although Cuchiaro does not disclose "a second coating part provided on the top surface of said main wiring layer," it would have been obvious to modify the semiconductor device of Cuchiaro to include a coating layer on the top surface of the wiring layer as disclosed in Yokoyama to aid in preventing junction leak failure. Applicant respectfully disagrees.

Yokoyama does not disclose a coating layer of *a ferroelectric capacitor* including "a second coating part provided on the top surface of said main wiring layer" as recited in the present claims. The coating layer prevents any reaction between substances from outside the device and the surface of the main wiring layer. Because no reducing agent is produced in the main wiring layer, the degradation of the characteristics of the capacitors is prevented (see page 5, line 9-17 of the present specification).

Rather, Yokoyama discloses *a transistor* having a coating layer (45) on the top surface of a metal wiring layer (43). The coating layer is provided to prevent junction leakage by migration of silicon from a diffusion layer (35) to a tungsten layer provided on the wiring layer (43). The *transistor* in Yokoyama does not teach or suggest a "second coating part provided on the top surface of said main wiring layer" *for use within a ferroelectric capacitor*. Further, it would not have been obvious to combine Cuchiaro with Yokoyama because ferroelectric capacitor lacks a

diffusion layer and thus does not involve the prevention of the migration of silicon from a diffusion layer. Because Yokoyama does not teach or suggest the claim recitation and there is no motivation to combine the reference with Cuchiario, the Examiner has failed to establish a *prima facie* case of obviousness.

With respect to recitation (c), the Examiner on page 4 of the Office Action asserts that Furuhashi discloses a coating part (5) on the sides of wiring layer (3). The Examiner further asserts that it would have been obvious to modify the semiconductor device of Cuchiario to include a coating layer on the sides of the wiring layer as disclosed in Furuhashi to aid in improving the reliability of the wiring layer. Applicant respectfully disagrees. Furuhashi does not disclose a coating part (5) on the sides of wiring layer (3). Rather, Furuhashi discloses a silica layer (coating part (5)) that is enclosed by SiN layers (4) and (6) for preventing degradation of the reliability of wiring layer (3). In the present invention, the "third coating provided on side faces of said main wiring layer" is adjacent to the main wiring layer. However, in Furuhashi, there is a SiN layer (4) between the wiring layer (3) and the coating part (5). Therefore, Furuhashi does not disclose a "third coating provided on side faces of said main wiring layer," and thus, the examiner has not established a *prima facie* case of obviousness.

Accordingly, amended claim 1 is patentable for at least the above reasons. Claims 2-5 and 7-15 are also patentable based on their dependency from claim 1.

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Appl. No.: 09/893,487

Conclusion

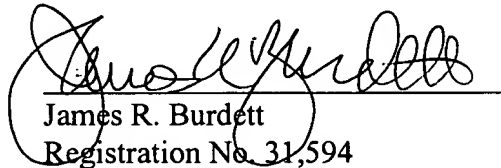
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

Date: _____

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Version with markings to show changes made

In the Claims

Please amend claim 1 as follows:

1. A wiring layer structure connected to a first electrode of a ferroelectric capacitor having first and second electrodes, comprising:

a main wiring layer including a first material; ~~that reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer; and~~

a coating layer including a first coating part provided between said main wiring layer and said first electrode, a second coating part provided on the top surface of said main wiring layer, and a third coating part provided on side faces of said main wiring layer;

wherein said first material reacts with a substance to produce a reducing agent, said substance being infiltrated from the outside to this main wiring layer, and said coating layer is conductive and comprises a second material for preventing the infiltration of said substance into said main wiring layer.

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